

SUCCESS STORY

NETL SORBENT TECHNOLOGIES LICENSED FOR USE IN BIOMASS-TO-BIOFUEL CONVERSION PROCESS WITH CARBON CAPTURE AND STORAGE

The U.S. Department of Energy's National Energy Technology Laboratory (NETL) has granted a license for two of its patented sorbent technologies: carbon dioxide (CO₂) removal and water-gas shift (WGS) reaction enhancement to CogniTek Management Systems "CogniTek," a renewable energy systems developer. CogniTek plans to implement a regenerable magnesium sorbent, used in both NETL technologies, as part of its spinout MG Fuels' integrated biomass-to-biofuel conversion process.

While much of the biofuel market relies on corn-based ethanol, CogniTek plans on providing a modular process, located at the source of the biomass, capable of accepting a wide range of lignocellulosic plant matter for feedstock, including quick growing grasses and trees, nuisance crops, and agricultural and commercial waste.

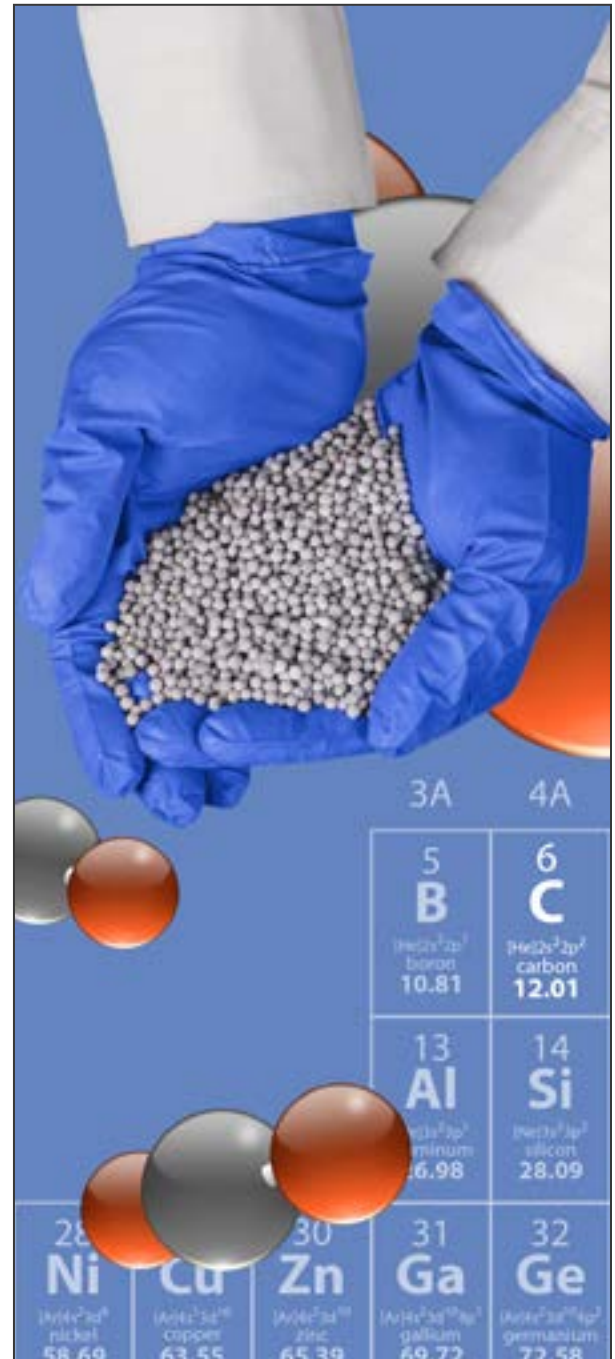
The liquid biofuels created during the conversion process can then be used as transportation fuels for vehicles (including hybrid) or biofuels to create electricity for distributed power generation at the biomass site, leveraging an ultra-high-efficiency ceramic engine being developed by CogniTek. While producing electricity for power generation, the engine also generates high-quality waste heat that contains steam and CO₂. This gaseous stream can be converted into hydrogen as a result of the WGS reaction, which will further increase system efficiency.

CogniTek is using the regenerable magnesium hydroxide sorbent prior to the WGS reaction to both remove CO₂ and form H₂O, so that less steam is required for the WGS reaction, resulting in a net energy savings. The sorbent is then employed again after the WGS reaction to remove additional CO₂, providing a stream of hydrogen to further increase system efficiency. Residual steam then regenerates the sorbent.

The integrated biomass-to-biofuel conversion process with power generation reduces overall carbon emissions, because the plants used as feedstock consume CO₂ from the atmosphere as a part of their natural growth process. Additionally, biomass is an abundant domestic resource and may significantly contribute to the renewable fuel market within the next decade.

Under the patent license agreement, NETL will receive royalties as CogniTek begins implementation of the technologies.

The two patented technologies being licensed by CogniTek were developed by NETL researchers, Ranjani Siriwardane, Robert Stevens Jr., and James Fisher II.



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